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AUTHOR Strickland, Bonnie R.; Hale, W. Daniel
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ABSTRACT

Eighty-eight males and females participated in one of three affect inducing conditions which involved reading neutral, depression, or elation statements. Subjects in the depression condition, in contrast to the elation group, reported themselves to be more depressed, anxious, and hostile, were less expansive in graphic expression and less likely to prefer activities of a social and physical nature. Responses in the neutral group fell between elation and depression. Implications are suggested for a cognitive mediation theory of depression. (Author)

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EFFECT OF INDUCED MOOD STATES ON ACTIVITY AND SELF REPORTED AFFECT

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Bonnie R. Strickland, W. Daniel Hale
University of Massachusetts
and Linda K. Arderson
Emory University

A number of personality and social psychologists have attempted to investigate those personal affect states and situational determinants that lead to altruistic or prosocial behaviors. Berkowitz and Connor (1966) found students more likely to be helpful toward others after completing a task on which they were successful. These researchers suggested that prosocial behavior was enhanced by the positive affect induced by success which they called the "glow of good will." Bryan and London (1970), Isen (1970), and Krebs (1970) have also reached similar conclusions, namely that subjects "feel good" after successful experiences and are more likely to engage in altruistic behaviors. A possible problem in this research, however, is the extent to which a sense of competence (Kazdin and Bryan, 1971) or perhaps expectancy of success (Feather, 1966) is contributing to the results rather than, or in addition to, positive affect. Moore, Underwood and Rosenhan (1973) attempted to clarify this problem experimen-

tally by inducing affect by means other than success and failure. They had children think of something happy or think of a sad event. Those children given the instructions to think happy thoughts were significantly more likely to contribute money to other children than those subjects told to think of sad events. These same experimenters (Underwood, Moore and Rosenhan, 1973) using the same affect induction manipulation, also found that children in the happy and sad conditions self rewarded more than children in a control group. These results again demonstrated that a simple cognitive manipulation of affect appeared to have significant impact on behavior.

If mood can be manipulated in the psychological laboratory, without the complicating influence of task performance, then obviously a number of questions revolving around the effects of positive and negative affect states can be raised and possibly answered. While most investigators have been interested in manipulating affect for purposes of eliciting prosocial behaviors, the present study is an investigation of mood induction with specific interest directed toward depressive behaviors. Theories of depression currently range from a behavioral approach in whioh depressive reactions are seen as reactions to the loss of response-contingent positive reinforcement (Lewinsohn, 1972) to theories in which cognitive mediating variables are seen as determinants of depressive reactions (Beck, 1967). Beck states that a person's mood is influenced by the way in which one structures his

experience and he believes that depressives are likely to conceptualize the events that happen to them as failure experiences. Beck's writings are similar to those of Ellis (1957) who explains neurotic behavior as resulting from the holding of irrational values and one's failure to live up to them. The present research may provide support for the cognitive theories if negative mood states can be cognitively induced in the laboratory and if they are followed by behaviors commonly associated with depression.

While a sad or unhappy mood is often one of the major defining characteristics of clinical depression, little empirical evidence is available describing the specific effects of mood on behavior. This paucity of research is likely due to a number of problems including the difficulty of defining depression. Depression is a term given to symptomatology reported by normal, neurotic and psychotic persons, may be temporary or chronic, and is likely multidimensional. While there are theorists and clinicians who consider depression a well defined disease entity distinct from normal mood, implicit in most current theories of depression (Beck, 1967; Lewinsohn, 1972; Phares, 1972) is the assumption that depression, or at least non-psychotic depression, is on the same contimuum as normal moods. This assumption suggests that whatever is operating to elicit depression in a normally functioning individual is qualitatively the same as that which caused severe depression. Affective disorders are thought to be primarily a

matter of degree, and depressive symptoms are reported by most individuals (Wessman and Ricks, 1966). Certainly, one advantage of this assumption is that mood changes may be investigated in a controlled situation using normally functioning individuals. The use of hospitalized depressives as subjects in most previous research has raised a number of methodological problems. Subjects are in an environment typically different from ordinary situations for most adults and are influenced by the prevailing mores of the particular institution in which they find themselves. Often, depressives are receiving treatment which is likely inconsistent from population to population and may take a number of forms ranging from drug to behavior therapy. Finally, as mentioned earlier, diagnoses are notoriously imprecise and adequate control groups are difficult to obtain.

Thus, the methodology of the present research utilizes subjects of a supposedly normally functioning population and will be an attempt to manipulate mood via a cognitive mediating process in which subjects are asked to think of certain depressing or elating aspects of themselves. This type of mood induction is taken from the work of Velten (1968) who designed a number of self-referent statements across these conditions. Velten found that subjects who read elation sentences, in contrast to subjects who read depression statements, gave superior performance on a number of behavioral tasks including writing speed, decision time, and word association time. No consistent

or significant performance effect was found in a control group who read neutral statements or among subjects who role played depression and elation. Aderman (1972), using Velten's statements with college males, found subjects who had read the elation statements significantly more likely than subjects in the depression group to volunteer for an unpleasant future experiment.

The dependent variables used in the present study are chosen to reflect behaviors assumed to be related to depression and they are reported by clinicians to be salient diagnostic characteristics of depressive patients. An obvious dependent variable is an accounting of self reported mood. Because depression may not be a unitary state and because depressive symptomatology is often associated with reports of anxiety, a multiple affect inventory will be used. The role of introjected anger is also thought to be significant in an understanding of depression. Consequently, self report of depression, anxiety and hostility will be elicited. In considering affective disorders, a number of clinicians have been interested in the way depressive individuals experience time. Wallace and Rabin (1960) believe that a depressive probably has a distorted judgment of time and Beck (1967) reports that depressed patients feel that time is passing more slowly than normal. Since no empirical data is available to support these contentions, in the present study following mood induction, subjects will be asked to estimate passage of time

as a test of these ideas. Clinicians also report that many depressives appear to have little energy and wish to withdraw from social interaction. In 1960, Wallach and Gahm designed the Graphic Constriction-Expansion measure to reflect a person's desire for isolation from others. They did find graphic expansiveness to be related to social extraversion and they also report a moderate relationship between expansiveness and openness of emotional expression. Messick (1965) used this measure in an experiment which took place on the Saturday following the assassination of John F. Kennedy. He assumed that the college subjects came to the experiment upset and depressed about the events of the day before. In contrast to a control group that was run the following February, Messick found females in the November group to be significantly less expansive in graphic expression. Also, similarly to the graphic expression measure, Lewinsohn (1964) and Wadeson (1971) report that depressed patients who are asked to draw designs or human figures cover less space on their drawings than do control patients. Finally, Zweigenhaft and Marlowe (1973) found expressive movement, as assessed via signature size, to be related to status and self esteem. Thus, the graphic expression measure appears to reflect social approach, withdrawal, self confidence and depression, and will be used in the present study. Additionally, to investigate social withdrawal and retardation in physical activities following mood induction, subjects will be asked to rate their

preferences for engaging in a number of behaviors falling along social/solitary, active/inactive dimensions.

It is hypothesized that subjects having undergone the depressive affect manipulation, in contrast to subjects in the elation condition, will:

1) report more depression, anxiety, and hostility
2) perceive the passing of time more slowly
3) be more constricted in graphic expression
4) prefer to engage in more solitary and physically uninvolving activities

It is expected that subjects in a neutral condition will give responses that fall between the responses of the depression and elation groups.

Method

Subjects:

Subjects were male and female college students enrolled in psychology courses at a small, private university. Subjects were run in one of two administrative situations. One set of subjects consisted of students recruited from a general introductory course in psychology who received credit for participating in experiments. This set of 22 males and 34 females was run in small groups with numbers ranging from 5 to 15. The second set of subjects was comprised of members of an introductory personality research course. Subjects were told in advance that the experimenters would be present

and conducting an experiment during a regularly scheduled class period. Seventeen males and 15 females attended class and participated in the study.

Experimenters:

Experimenters were a male and female graduate student, both of whom were enrolled in a Clinical Psychology program. The experimenters were of the same age and dressed casually. They participated equally in administering the experiment.

Procedures:

At the beginning of the study, subjects were asked to complete the Multiple Affect Adjective Check List (Zuckerman, Lubin, and Robins, 1965). (Two other questionnaires were also administered but the data were being collected for another study and will not be reported here). Subjects were then randomly divided into three groups for purposes of mood induction and were given booklets containing the Velten self reference statements (1968). One group of subjects (n=31) received the positive statements, for example "I feel so vivacious and efficient today -- sitting on top of the world." One group (n=31) received the negative self-referent statements, for example "It often seems that no matter how hard I try, things still go wrong." One group (n=26) read the neutral statements, for example "99.1% of Alaska is owned by the federal government." Subjects were given Velten's standard instructions which included asking the subject to read the statement

to himself (herself), to try not to spend too much time on any one statement, and to try to respond to the feeling suggested by each statement. The booklets that were given to the subjects contained the instructions and a statement on each page. Subjects were asked to read the statements at their own speed and were given 7½ minutes to go through the booklets. Subjects who completed the sentences before the allotted time was over were encouraged to go back and reread some of the statements. All subjects did complete reading the booklets and most reread some of the statements. After the 7½ minutes had elapsed, subjects were asked to estimate the time that they had spent reading the statements. Estimates ranged from 3 to 15 minutes and these served as scores for time estimation. Subjects were then asked to complete the Multiple Affect Adjective Check List again. The Check List was scored in the standard way for anxiety, depression and hostility. Difference scores (with a constant of 20 added to avoid negative numbers) were used in analysis of the results.

In an attempt to heighten or reinstate the induced mood state, subjects were further instructed to reread the last 25 statements. They were given 3½ minutes to do this and all subjects finished. Subjects were then administered the Graphic Constriction-Expansion measure designed by Wallach and Gahm (1960). In this task, subjects were asked to doodle on a blank piece of paper with which they were provided.

They were asked to remain in the induced mood and let their doodling reflect their feelings. They were told that the doodles should not show any recognizable forms. The Graphic Constriction-Expansion measure was scored via means of a grid described by Wallach and Gahm. An 8 by 10 inch cross grid consisting of twenty squares was laid out on a sheet of tracing paper, there being four squares across and five down the sheet. This grid was placed over each page of doodles. Keeping the grid's edges parallel to the edges of the page of doodles and keeping the long dimensions of both grid and paper parallel, the grid was adjusted until the number of squares in which doodling fell was minimized. This minimum number of squares was then counted, which gave a possible score of from 1 to 20 (the actual range in the present study was 1 to 18). Without knowledge of conditions under which subjects were run, an independent rater scored all the doodles. As a reliability check, a second rater, also blind to the experimental conditions, scored half the doodles. There was complete agreement between the raters in every case but one, in which a one point discrepancy was noted and resolved by consensus between the two raters. Wallach and Gahm (1960) report a high interscorer reliability (.96) using this scoring method.

The final dependent variable was response to the Social/Solitary Activities Questionnaire, an instrument designed specifically for this study. Subjects were asked to look

through a list of possible activities and then indicate their preferences for involving themselves in each of these activities at the moment. Subjects were asked to rank from one (most prefer) to 12 (least prefer) their preferences for the following:

_____ listen to records along
_____ listen to records with others
_____ watch TV alone
_____ watch TV with others
_____ daydream or take a nap
_____ talk with friends
_____ take a walk alone
_____ take a walk with friends
_____ go shopping by myself
_____ go to a party with friends
_____ engage in some strenuous activity alone, such as ride a bicycle, go swimming, or run
_____ engage in some strenuous activity with others, such as play volleyball, or catch, or some other team sport

These activities were chosen to reflect four possibilities: social activity, social inactivity, solitary activity, and solitary inactivity. These activities were then scored on each of the four dimensions.

Results

Because subjects were run under one of two experimental sets and to analyse for possible sex differences, a 2 (administrative set) by 2 (sex) by 3 (depression, elation, neutral

mood manipulation) analysis of variance for unequal n's was computed for each dependent variable. No significant main effects or interactions emerged for any variable as a function of administrative set. One main effect for sex did emerge in that males overall were more likely to be expansive on the Graphic Expansion-Constriction measure. Also, there was a sex by mood interaction on preferences for solitary inactivity which will be discussed below. For simplicity of presentation, the means and standard deviations of each of the dependent variables for each of the mood manipulations combined for sex and administrative set are presented in Table 1. The resulting F's, multiple t comparison, and significance levels for the mood manipulations are also shown in Table 1.

On the Multiple Affect Adjective Check List, difference scores between pre- and post-mood manipulation conditions for subjects in the depression condition reflected significantly more anxiety, depression, and hostility than responses of subjects in the elation condition. Self reported mood of subjects in the neutral condition fell between these groups and t-tests for multiple comparisons were also computed. For anxiety and depression, each of the positive, negative, and neutral groups were significantly different from each other. Self-reported hostility was not significantly different in the depression and neutral groups, but the elation group was significantly less likely to report hostility than subjects in the neutral group.

Differences between groups on time estimation failed to reach an acceptable level of significance ($F=2.52$, $p<.09$). The mean responses are in the predicted direction with the depression subjects reporting time to be longer than the neutral subjects, who report time to be longer than the elation subjects.

On the Graphic Expansion-Constriction Measure, a main effect across conditions was found with subjects in the elation group giving more expansive responses than subjects in the depression group. Responses of subjects in the neutral group were significantly different from those of the negative group but not from those of the elation group.

In considering the Activities Inventory, it must be noted that the social-solitary/active-inactive dimensions are not independent of each other. Persons who give high preferences on one dimension must give low preferences on the others. Two main effects for mood manipulation emerge across the dimensions. Subjects in the elation condition were significantly more likely to prefer activities of a social and physically involving nature and less likely to choose solitary inactivity than were subjects in the depression condition. Responses of subjects in the neutral group were not significantly different from responses of the elation group. When solitary and active or social and inactive items were combined, there were no significant differences as a function of mood manipulation. However, a sex by condition interaction was found

($F=4.48$, $p < .02$) with males in the depression and females in the elation condition preferring social inactivity. A sex by condition interaction ($F=4.42$, $p < .02$) was also found for solitary/inactive preferences in that it was the responses of the female subjects that contributed to the significant main effect. This dimension was not predictive for the males.

Discussion

Results of the present study present rather clear evidence that mood states can be manipulated in the psychological laboratory and that they influence self reported affect and behavior in predictable ways. Subjects in a condition of induced negative affect (depression) were significantly more likely to present themselves as anxious, depressed and hostile than were subjects in a condition of induced positive affect (elation). Negative affect subjects were also significantly more likely to be constricted on graphic expression and less likely to prefer to engage in social, physically involving activities than were the subjects in the elation condition. Responses of subjects in a neutral group fell between the responses of subjects in the affective arousal groups.

The findings that the self reported affect states change as a result of the mood manipulation are not surprising. In fact, one of the strong aspects of these findings may be a methodological check in that what the experimenter hoped to manipulate was indeed reported to have changed. This is par-

ticularly true for the self report of depression. It is also interesting to note that self reported anxiety and hostility also changed as a result of the depression/elation manipulation. The depression condition subjects reported significantly more anxiety than the neutral and elation groups, and the elation condition subjects reported significantly less hostility than the others.

A number of theorists have argued that depression is not a unitary state (Izard, 1972) and the findings of the present study do suggest that a change in a depressive state is accompanied by changes in reported anxiety and hostility. These findings may also have some implications for a theoretical understanding of the dynamics of depression. Within a psychoanalytic framework, depression is often thought to reflect anger or hostility turned against the self. If depression is accompanied by increased hostility, as is suggested here, then experimentation directed toward investigating the target of the hostility might be most valuable.

The finding that mood manipulation effects graphic expression is in the predicted direction with subjects in the elation condition more expansive than depression condition subjects. These findings reflect the impressions of both clinicians and laymen that when a person feels "good" they are more likely to be more physically expansive than persons who are depressed. Additionally, these findings are quite similar to others reported in the literature in which persons

who are depressed are less likely to be expansive in graphic expression such as drawings. In the past, this research has been thought to be indicative of an individual's desire for social withdrawal and lowered self-confidence. However, another possible explanation remains. Velten (1968) found that subjects in his elation condition wrote more quickly than subjects in the depression condition. After induced depression, subjects may simply be exhibiting a lowered energy level and thus drawing at a slower pace and covering less space. This interpretation is also consistent with depressive symptomatology in terms of reported loss of energy and motor retardation.

The finding that the male subjects are overall more expansive than the female subjects is also not surprising in view of the research of Zweigenhaft and Marlowe (1973). These experimenters found the handwritten signatures of males under relaxed conditions to be significantly larger, that is covering more space on the paper, than those of females.

While the prediction that subjects in the depressive condition would estimate time to be passing more slowly than subjects in the elation condition was not supported, there was a trend at the .09 level for this hypothesis. A replication of this finding might be in order. Depressives often report that life has little meaning for them, that time passes slowly, and that they are bored. Time perception is a difficult variable to study, but results of the present study do

suggest that there is perhaps a difference in the ways people perceive the passing of time as a function of mood state.

The finding that moods influence preferences for activities was also one that was predicted from clinical impressions. Depressives tend to be socially withdrawn, often preferring to remain alone, and do not give the impression of being energetic, physically active persons. Results of the present study suggest that preferences for social interaction and involvement in physical activities can well be a function of mood state.

Overall, these results give implicit support to a cognitive theory of depression. The things people say to themselves, about themselves, appear to have a significant impact on behavior. The complex mechanisms accompanying cognitive mediation remain unknown and a number of hypothetical explanations are open. For example, in considering the self-referent statements, subjects may have dwelled on their failure experiences. This conceptualization is similar to those of Lewinsohn (1972) and Beck (1967) in that an experience of failure, or an interpretation of an event as a failure situation, produces depression. Rather than evaluating oneself within a competence framework, however, that is having to do with mastering one's life situations, subjects may have become involved in a more complicated cognitive schema in which one feels a loss of value or esteem as a person in relation to others, or becomes so involved with a remembrance of unhappy

or sad events that no time or energy is left for positive evaluation along any dimension. From the data in the present study, it is difficult to know the differential influence of depression versus elation. In some cases, depression condition responses were significantly different from those of the neutral or elation conditions, and in some cases, elation condition responses were different from the other two groups. No consistent differential effects appeared.

Although women are more likely to present depressive symptomatology than men (Silverman, 1969), results of the present study are fairly similar across sexes except for some of the responses on the activities questionnaire.

While results of the present experiment do suggest that mood can be manipulated in the psychological laboratory with predictable results, there are still a number of limitations in this study. Subjects were run in groups and it might well be that results would have been more robust if subjects were run individually with a more precise monitoring of the time spent on reading and thinking about the statements. Other methods for inducing mood states should be investigated and experimenters might well explore the long term effects of induced mood, if any. It would also be important to consider the individual difference variables that may lead a person to be more or less influenced by affect manipulation. In the present study, the dependent variables were assessed via means of questionnaires and graphic expression and it would

be most important to pursue the social interaction aspects more carefully with opportunities for subjects to actually involve themselves with other people. Another important avenue of research would be to consider the effects of mood induction on other variables assumed to be related to depression such as psychomotor retardation, learning and performance rates, and speech patterns.

Table 1

Means, Standard Deviations, F Values and t-Comparisons for Dependent Variables Across Induced Mood States

	Depression	Neutral	Elation	F
Anxiety	22.26 3.86	20.46 3.39	18.90 2.55	7.90 $p < .001$
		$1.80 > 1.45$ $p < .05$	$1.56 > 1.45$ $p < .05$	
Depression	26.16 8.89	20.27 5.18	17.19 4.31	14.79 $p < .001$
		$5.89 > 2.87$ $p < .05$	$3.08 > 2.87$ $p < .05$	
Hostility	23.23 4.59	21.92 3.10	18.48 3.72	11.68 $p < .001$
			$3.44 > 1.74$ $p < .05$	
Graphic Express.	5.26 3.78	7.15 4.38	8.58 4.60	5.32 $p < .007$
		$1.89 > 1.77$ $p < .05$		
Time Est.	6.29 2.37	6.19 2.97	5.06 1.93	2.52 $p < .09$
Solitary Inactivity	18.61 7.63	19.81 6.48	23.74 6.71	4.85 $p < .01$
			$3.93 > 2.97$ $p < .05$	
Solitary Activity	20.94 5.43	22.27 6.08	21.03 6.36	.04 NS

	Depression	Neutral	Elation	F
Social Inactivity	18.06 5.10	16.50 4.93	18.35 5.22	1.07 NS
Social Activity	20.39 7.20	19.80 6.99	14.65 6.80	6.29 $p < .003$

$5.15 > 3.07$
$p < .05$

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